

## RECENT DEVELOPMENTS IN BALLISTIC ELECTRON EMISSION MICROSCOPY \*

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The physics of carrier transport through thin films and across interfaces is fundamental to the understanding of material systems and microelectronic devices. Ballistic-electron-emission microscopy, or BEEM, comprises a family of spectroscopies which addresses the transport and scattering of electrons and holes in multilayer structures. BEEM is based on scanning tunneling microscopy (STM), which has previously been restricted to surface studies, and is therefore highly spatially resolved. BEEM, as a result, offers a fundamentally new and powerful way to investigate interface structure and formation on a nanometer lateral scale. BEEM has developed into a probe of carrier transport, carrier scattering, and interface band structure. BEEM continues to be a rapidly growing field with many active research efforts in the U. S., U. K., Europe, and Japan.

Recent progress has extended BEEM to the study of minority carrier processes, strained-layer systems, and the fundamentals of vacuum tunneling. In addition, progress continues on the tunneling transmission microscopy experiment, designed to more directly probe the transport and scattering processes of hot electrons in thin films.

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